

Response to Office Action mailed December 14, 2007

Serial No. 10/595,046; filed June 9, 2006

Inventors: Berger et al.

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### **REMARKS**

Claims 3, 9, and 14 have been amended. New claim 37 has been added and Claims 16-36 have been cancelled while preserving their right of reentry into this or any other suitable application. Claims 1-15 and 37 are therefore pending and presented for review. Favorable reconsideration and allowance are requested in light of the remarks which follow.

#### **1. Allowable Subject Matter and Objections to the Claims**

Applicants thank the Examiner for indicating allowable subject matter in each of claims 3-7, 9, and 14. Each of claims 3-7, 9, and 14 is objected to as depending from a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base and any intervening claims. In accordance therewith, Applicants herein amend claims 3, 9, and 14, whereby they are now in proper allowable form. Claims 4-7 are allowable as depending from allowable claim 3, directly or indirectly, as well as each on its own merits.

#### **2. Objections to the Specification**

The Examiner objects to the abstract of the disclosure as containing legal phraseology. Applicants herein amend the abstract, removing the offending language and resolving the issue.

#### **3. Rejections under 35 U.S.C. § 112**

The Examiner rejects claim 9 under 35 U.S.C. § 112, second paragraph, as being indefinite based on an antecedent basis issue. Applicants amend claim 9, resolving the issue.

#### **4. Prior Art Rejections**

The Examiner rejects claims 1, 2, 8, 11, and 12 under 35 U.S.C. § 102(e) as being anticipated by German Patent Application No. DE 101 58 266 A1, listing inventors Bendel et al. and assigned to Bosch (herein "the Bosch application"). Claims 1, 2, 8, 10, 11-13, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Bosch application.

**a. Recapitulation of the Invention\***

The invention relates to hand-held working tools, e.g., drilling or impact hammers, stampers, and others, a pneumatically damped or semi-active vibration isolated handles. This is done by way of an air spring provided generally between a tool body or vibration exciter and handle. Prior art damping or anti-vibration systems include rubber bumpers or spacers, helical compression springs provided between vibration exciters and handles. Some of the helical compression spring implementations are part of passive vibration control assemblages while others include active components such as various actuators that cooperate with the helical compression springs. Prior art systems with helical compression springs and cooperating active components utilize the actuator(s) to ensure a distance between a hammer housing and the handle remains constant. Such prior arts systems require electronic sensors to detect the distance between a hammer housing and the handle, and electromechanical actuators to pull or push the handle for maintaining the desired distance between the hammer housing and the handle. Such electronic sensors and electromechanical actuators can be complex and expensive, and can be damaged by or fail within the severe use environments that are typical of such vibration generating hammers and stampers.

In the present invention, the vibration isolating device has an air spring that includes an actuator which pneumatically produces a force that opposes various operational forces within the tool that would otherwise transfer vibrations into the handle. During use, the air spring is filled with compressed air, e.g., the air filling characteristics can be modified to correspondingly modify the spring characteristics of the device. In this configuration, the load deflection curve or spring stiffness curve of the air spring can be changed by varying the preloading of the air spring to modify the operational characteristics of an actuator within the air spring and thus the performance characteristics of the air spring itself. In this regard, effective vibration isolation

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\* This Section 4(a) is presented for background purposes so the Examiner may understand the state of the art and, in general terms, the Applicants' contribution thereto. It is not intended to constitute a specific traversal of any particular rejection. That task instead is performed in

can be effectuated by maintaining a substantially constant length of the air spring. Such configuration correspondingly reduces or eliminates the requirement of at least some costly and complex electronic and electromechanical components that are prone to failure in the intended severe end use environments.

**b. Traversal of Rejections**

Applicants respectfully traverse the above-referenced rejections and assert that Bosch application does not disclose each and every element of the novel and non-obvious independent claim 1.

Independent claim 1 recites a handheld working tool with a first unit that is excited by vibration during operation and a second unit that can be moved to a working direction (A) relative to the first unit, and a vibration isolation device between the first and second units. An actuating force, produced by at least one actuator within the vibration isolation device, at least partially compensates an operating force that acts in the working direction (A). Furthermore, **the actuator has a handle air spring whose filling with compressed air is able to be modified, and a spring device is situated parallel to the actuator**, between the first and second units.

Before discussing the specifics of the rejection, it should be noted that the devices, methods, and purposes of the various cited patents differ substantially from those of Applicants' invention.

The Bosch application discloses a device for vibration damping a handle 3 of a machine tool 1. The damping device connects the handle 3 to a housing 2 of the machine tool 1 by at least one helical compression spring 4. An actuator 5 acts on the helical compression spring in an effort to keep the distance between the handle 3 and the housing 2 of the machine tool 1 almost constant, independent of the actuating force exerted on the handle. Namely, the spring 4 and the actuator 5 are inline or coaxially arranged with each other. If the operator inputs more pressure on the handle, the spring 4 compresses so that the handle advances toward the hammer housing, reducing the distance therebetween. A sensor detects that this distance reduction between the

hammer housing and handle, provides a signal to the actuator to push the hammer housing and handle away from each other, seeking the original distance. In this regard, the spring characteristics remain unchanged during operation which is intuitive because a helical compression spring cannot dynamically change its performance characteristics. The actuator serves as a spring length compensator, attenuating variations in the distance between the hammer housing and the handle.

Turning now to the substance of the rejection, the Bosch application does not and cannot disclose or suggest an **actuator has a handle air spring, whose filling with compressed air is able to be modified, and which is parallel to a spring.**

The Bosch application is devoid of disclosure in any regard relating to (i) a handle air spring as part of an actuator, and (ii) being able to modify the compressed air within such handle air spring. In particular the Bosch application expressly and *strongly teaches away* from providing an actuator that is parallel to a spring. The Bosch application teaches that an actuator and spring must be *inline or coaxial* with each other.

Namely, the entire functionality of devices according to the Bosch application is based on its particular arrangement of the spring 4 and actuator 5. One of the ends of the spring 4 is seated on a piston of the actuator 5, enabling the actuator to compensate for distance variations between the hammer housing and the handle by moving the end of the spring 4 relatively nearer to or further from the handle as required.

In other words, the Bosch application discloses *purposefully* coaxially aligning the spring 4 and actuator 5, *not* arranging them parallel to each other. This is because the purpose of the Bosch application is to provide spring length compensation for maintaining a constant distance between a hammer housing and handle. In this regard, the actuator must axially abut the end of the spring.

To modify the Bosch application to provide an actuator and spring that are parallel to each other would eliminate the cushioning effect that the spring has on the actuator's distance compensation tasks. It is noted that with the spring extending axially from the actuator piston,

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the spring resiliently separates the actuator piston from the hammer body. Therefore, upon moving the spring laterally so that it and the actuator are parallel to each other, the spring would no longer separate the actuator piston from the hammer body. In this regard, if the actuator piston were left at the same length, then the device would not function since the piston would not push against anything and therefore could not influence the distance between the hammer body and handle. In the alternative, if the piston were extended so that it interfaced the hammer body enabling it to influence the distance between it and the handle, then vibrations could be transferred from the hammer body, through the actuator piston and actuator, and into the handle. In either regard, the proposed modification renders the Bosch application unsuitable for its intended purpose.

Even if (contrary to the clear facts) the Bosch application did not teach away from the proposed modification, nothing in the Bosch application or “common sense,” short of improper hindsight reconstruction gleaned from Applicants’ own disclosure, suggests modifying the Bosch application to produce the claimed invention. Independent claim 1 is correspondingly believed allowable over the cited prior art in condition for allowance.

Nor does the Bosch application disclose each and every limitation of claims 2-15, whereby these claims are allowable as depending from allowable claim 1, directly or indirectly, as well as on their own merits.

For instance, referring to claim 4, it further recites that the actuator has a compressed air storage device that is able to be filled with compressed air by a drive piston, which the Bosch application does not and cannot teach.

#### **New Claims and Conclusions**

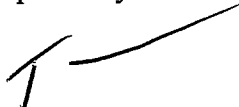
New claim 37 is directed generally toward the subject matter of claim 1, only reciting the invention with even more specificity. Accordingly, Applicants assert that claim 37 is allowable for at least the reasons stated above with respect to claim 1, as well as on its own merits. For example, new claim 37 further recites a preload value of a pneumatic spring that is variable for maintaining a length of pneumatic spring at a generally constant value, reducing transmission of

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vibrations between first and second units of the tool.

Applicants assert that claims 1-15 and 37 are in compliance with 35 U.S.C. §§ 102 and 103 and each defines patentable subject matter. A Notice of Allowance is therefore respectfully requested. A fee in the amount of \$420 is believed due with this communication, for the two independent claims in excess of three (\$210 apiece, large entity). Should the Examiner consider any other fees to be payable in conjunction with this or any future communication, the Director is authorized to direct payment of such fees, or credit any overpayment, to Deposit Account No. 50-1170.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Timothy E. Newholm', with a long horizontal stroke extending to the right.

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